

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) An oil pressure control device for ~~changing the operating range of use with~~ a vehicle transmission, which transmission has a shift lever that is configured to select a range from among the operating range including at least a drive range ~~which that~~ advances the vehicle, a reverse range ~~which that~~ reverses the vehicle and vehicle, and a stop range ~~which that~~ stops the vehicle, wherein the vehicle has forward and reverse frictional-engagement devices that convert: the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which that advances the vehicle or, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which that reverses the vehicle, wherein the only the forward frictional-engagement device clutch is engaged by oil pressure in the drive range, wherein the only the reverse frictional-engagement device clutch is engaged by oil pressure in the reverse range, and wherein both the forward frictional-engagement device clutch and the reverse frictional-engagement device clutch are released in the stop range, and a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

a ~~clutch~~ pressure adjusting device ~~which adjusts the oil pressure from a pump, and that engages or releases the forward frictional-engagement device or the clutch and reverse frictional-engagement device clutch by supplying the adjusted oil pressure to one of the forward frictional-engagement device and the clutch and reverse clutch, frictional-engagement device;~~

a sensor ~~which that~~ detects an operating a range selected by a driver of the vehicle, the shift lever; and

a controller ~~which that~~ controls the clutch pressure adjusting device based on a signal from the sensor, wherein the controller is configured to measure a stop-range selected time period during which the stop range is selected after the reverse range, and wherein the controller functions to control the pressure adjusting device to:

~~control the clutch pressure adjusting device to supply an initial oil pressure to the forward frictional-engagement device clutch and subsequently~~

decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the drive range is selected after the stop range or the reverse range; ~~has been selected from the reverse range, and when the time for which the stop range has been selected is longer than a time required for the oil pressure supplied to the reverse clutch to decrease to zero;~~

~~control the clutch pressure adjusting device to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and~~

~~after the predetermined time period has elapsed, control the clutch pressure adjusting device to increase the supplied oil pressure at a large increase rate, after the predetermined time period has elapsed,~~

wherein, during the predetermined time period, the supplied oil pressure is set depending on the stop-range selected time period.

2. (Original) The oil pressure control device as defined in Claim 1, wherein the predetermined time period is a period from when the oil pressure is decreased to when a backlash of a power train of the vehicle disappears due to forward rotation of the power train of the vehicle.

3. (Currently Amended) The oil pressure control device as defined in Claim-2, ~~wherein the predetermined time period depends on the size of the power train 1, wherein during the predetermined time period, when the stop-range selected time period is shorter than a predetermined value, the supplied oil pressure is set smaller as compared to when the stop-range selected time period is longer than the predetermined value.~~

4. (Currently Amended) The oil pressure control device as defined in Claim-1, ~~wherein the forward clutch comprises a clutch piston displaced by oil pressure, and a piston spring which pushes the clutch piston in an opposite direction to a force of the oil pressure, and the oil pressure supplied to the forward clutch during the predetermined time period is a slightly higher pressure than the pressure applied to the clutch piston from the piston spring, and is a lower pressure than the initial pressure 3, wherein the predetermined value for the stop-range selected time period indicates a time required for the oil pressure supplied to the reverse frictional-engagement device to decrease to zero.~~

5. (Currently Amended) An oil pressure control device for ~~changing the operating range of use with~~ a vehicle transmission, which transmission has a shift lever that is configured to select a range from among the operating range including at least a drive range which that advances the vehicle, a reverse range which that reverses the vehicle and vehicle, and a stop range which that stops the vehicle, wherein: the transmission wherein the vehicle has a forward/reverse change over part which is provided with a forward and reverse frictional-engagement devices that convert clutch which transmits a drive force generated by an engine to the transmission as a drive force which that advances the vehicle or, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which that reverses the vehicle, wherein only the the forward frictional-engagement device clutch is engaged by oil pressure in the drive range, wherein the only the reverse-clutch frictional-engagement device is engaged by oil pressure in the reverse range, and wherein both the forward frictional-engagement device and the clutch and reverse frictional-engagement device clutch are released in the stop range, and a speed change part connected to the forward/reverse change over part, the oil pressure control device comprising:

~~a clutch pressure adjusting device which adjusts the oil pressure from a pump, and that engages or releases the forward frictional-engagement device or the clutch and reverse frictional-engagement device clutch by supplying the adjusted oil pressure to one of the forward frictional-engagement device and the clutch and reverse-clutch, frictional-engagement device;~~

~~a sensor which that detects an operating a range selected by a driver of the vehicle, the shift lever; and~~

~~a controller which that controls the clutch pressure adjusting device based on a signal from the sensor, wherein the controller is configured to measure a stop-range selected time period during which the stop range is selected after the drive range, and wherein the controller functions to control the pressure adjusting device to:~~

~~control the pressure adjusting device to supply an initial oil pressure to the reverse-clutch frictional-engagement device and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the reverse range is selected after the stop range or the drive range; has been selected from the drive range,~~

~~and when the time for which the stop range has been selected is longer than a time required for the oil pressure supplied to the forward clutch to decrease to zero;~~

~~control the clutch pressure adjusting device to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and~~

~~after the predetermined time period has elapsed, control the clutch pressure adjusting device to increase the supplied oil pressure at a large increase rate, after the predetermined time period has elapsed,~~

wherein, during the predetermined time period, the supplied oil pressure is set depending on the stop-range selected time period.

6. (Original) The oil pressure control device as defined in Claim 5, wherein the predetermined time period is a period from when the oil pressure is decreased to when a backlash of a power train of the vehicle disappears due to reverse rotation of the power train of the vehicle.

7. (Currently Amended) The oil pressure control device as defined in ~~Claim 6~~ Claim 5, ~~wherein the predetermined time period depends on the size of the power train during the predetermined time period, when the stop-range selected time period is shorter than a predetermined value, the supplied oil pressure is set smaller as compared to when the stop-range selected time period is longer than the predetermined value.~~

8. (Currently Amended) The oil pressure control device as defined in ~~Claim 5~~, ~~wherein the reverse clutch comprises a clutch piston displaced by oil pressure, and a piston spring which pushes the clutch piston in an opposite direction to a force of the oil pressure, and the oil pressure supplied to the reverse clutch during the predetermined time period is a slightly higher pressure than the pressure applied to the clutch piston from the piston spring, and is a lower pressure than the initial pressure~~ 7, wherein the predetermined value for the stop-range selected time period indicates a time required for the oil pressure supplied to the forward frictional-engagement device to decrease to zero.

9. – 16. (Canceled)

17. (Currently Amended) An oil pressure control device for ~~changing the operating range of use with a vehicle transmission, which transmission has a shift lever that is configured to select a range from among the operating range including at least a drive range which that advances the vehicle, a reverse range which that reverses the vehicle and vehicle, and a stop range which that stops the vehicle, wherein the vehicle has forward and reverse frictional-engagement devices that convert: the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which that advances the vehicle or, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which that reverses the vehicle, wherein the only the forward frictional-engagement device clutch is engaged by oil pressure in the drive range, wherein the only the reverse frictional-engagement device clutch is engaged by oil pressure in the reverse range, and wherein both the forward frictional-engagement device clutch and the reverse frictional-engagement device clutch are released in the stop range, and a speed change part connected to the forward/reverse change over part,~~ the oil pressure control device comprising:

a ~~clutch~~ pressure adjusting means for adjusting the oil pressure from a pump, and for engaging or releasing engages or releases the forward clutch and frictional-engagement device or the reverse clutch frictional-engagement device by supplying the adjusted oil pressure to one of the forward frictional-engagement device clutch and the reverse clutch, frictional engagement device;

a ~~sensor~~ sensor means for detecting ~~an operating a range selected by a driver of the vehicle, vehicle;~~

measurement means for measuring a stop-range selected time period during which the stop range is selected after the reverse range;

a ~~control~~ first control means for controlling the ~~clutch~~ pressure adjusting means to supply an initial oil pressure to the forward frictional-engagement device clutch and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the drive range is selected after the stop range ~~has been selected from or~~ the reverse range;

a ~~control~~ second control means for controlling the ~~clutch~~ pressure adjusting means to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

~~a control~~ third control means for controlling the ~~clutch~~ pressure adjusting means to increase the supplied oil pressure at a large increase rate after the predetermined time period has elapsed,
wherein, during the predetermined time period, the supplied oil pressure is set depending on the stop-range selected time period.

18. (Currently Amended) An oil pressure control device for ~~changing the operating range of use with~~ a vehicle transmission, which transmission has a shift lever that is configured to select a range from among the operating range including at least a drive range ~~which that~~ advances the vehicle, a reverse range ~~which that~~ reverses the vehicle and vehicle, ~~and a stop range~~ which that stops the vehicle, wherein the vehicle has forward and reverse frictional-engagement devices that convert: the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force ~~which that~~ advances the vehicle or, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force ~~which that~~ reverses the vehicle, wherein the only the forward frictional-engagement device ~~clutch~~ is engaged by oil pressure in the drive range, wherein the only the reverse frictional-engagement device ~~clutch~~ is engaged by oil pressure in the reverse range, and wherein both the forward frictional-engagement device ~~clutch~~ and the reverse frictional-engagement device ~~clutch~~ are released in the stop range, and a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

~~a clutch~~ pressure adjusting means for adjusting the oil pressure from a pump, and for engaging or releasing ~~engages or releases the forward clutch and frictional-engagement device or the reverse clutch~~ frictional-engagement device by supplying the adjusted oil pressure to one of the forward frictional-engagement device ~~clutch and the reverse clutch, frictional engagement device;~~

~~a sensor~~ a sensor ~~means for detecting an operating a range selected by a driver of the vehicle, vehicle;~~

measurement means for measuring a stop-range selected time period during which the stop range is selected after the drive range;

~~a control~~ first control means for controlling the pressure adjusting means to supply an initial oil pressure to the reverse frictional-engagement device ~~clutch~~ and subsequently decrease the supplied oil pressure from the initial oil pressure to

a predetermined oil pressure, when the reverse range is selected after the stop range ~~has been selected from~~ or the drive range;

~~a control~~ second control means for controlling the ~~clutch~~ pressure adjusting means to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

~~a control~~ third control means for controlling the ~~clutch~~ pressure adjusting means to increase the supplied oil pressure at a large increase rate after the predetermined time period has elapsed,

wherein, during the predetermined time period, the supplied oil pressure is set depending on the stop-range selected time period.